Microclimate of the New Jersey Pine Barrens

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May 2011

Overview: There is an area about 30 miles to the east of Philadelphia that encompasses nearly seven different southeast New Jersey counties. A place where a mythical creature may live and a professional hockey teams garners its name…I am speaking of the New Jersey Devil and the New Jersey Pine Barrens. This write-up is not about the Devil, although that would be pretty cool, but rather this is about a sometimes large nocturnal temperature gradient that exists between the Barrens and surrounding areas. Fig 1 below shows an outline of the Pine Barrens.

Due to the type of sandy and loam soil the region has, clear skies and light winds are very conducive to an increased radiational cooling effect when compared to surrounding sites. The lack of urbanization coupled with a sparse population within the Pine Barrens further accentuates any nocturnal radiational cooling effects. There are also very few observation stations within the Pine Barrens to truly try to determine an average temperature difference compared to surrounding areas. This makes temperature forecasting within the Pine Barrens a little tougher.

Synoptic-scale Ingredients: It has been seen time and time again that forecasters should account for large temperature differences when a ridge of high pressure overhead allows winds to remain calm and skies to clear. With the ridge of high pressure axis directly overhead temperatures in the Pine Barrens can be ten degrees colder than the surrounding areas. Even with a few clouds above and a light wind temperature differences range between four to five degrees colder. See figure 2, an image of MODIS data on a clear, calm night over the Pine Barrens. Some MesoNet observations are overlayed on the image.

Diagnosis and Prognosis: With high pressure nearing the region or directly overhead, forecasters should be cognizant of enhanced radiational cooling within the Pine Barrens region. The best GFE tool to use would be to use the 'Make and Edit Area' button to highlight the Pine Barrens and then using the 'Adjust Temp Down' or 'Assign Value' tool to place the "correct" forecasted temperature. Differences of ten degrees have been seen when a fresh snow has fallen, but more times than not, a six to eight degree difference is more likely.

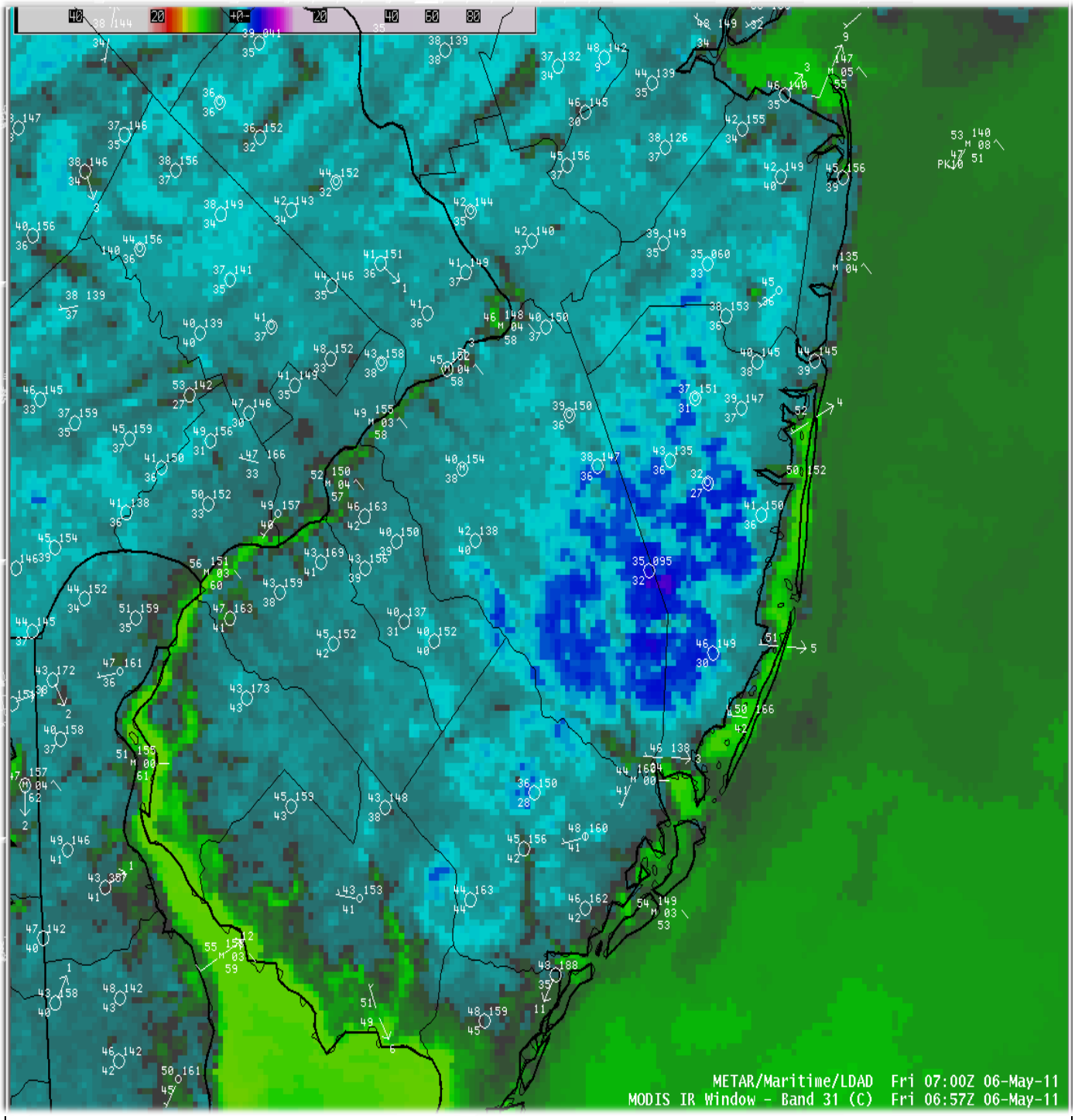

Figure 2, MODIS imagery showing an area of enhanced cooling over the Pine Barrens, with a temperature overlay.